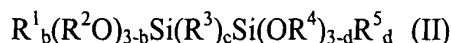


What is claimed is:

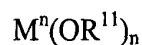
1. A composition comprising an organic polysilica partial condensate of one or more silanes of formula (I) and one or more silanes of formula (II):



wherein R is hydrogen, (C₁-C₈)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; Y is any hydrolyzable group; a is an integer of 1 to 2; R¹, R², R⁴ and R⁵ are independently selected from hydrogen, (C₁-C₆)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; R³ is (C₁-C₁₀)alkyl, -(CH₂)_h-, -(CH₂)_{h1}-E_k-(CH₂)_{h2}-, -(CH₂)_h-Z, arylene, substituted arylene, or arylene ether; E is oxygen, NR⁶ or Z; Z is aryl or substituted aryl; R⁶ is hydrogen, (C₁-C₆)alkyl, aryl or substituted aryl; b and d are each an integer of 0 to 2; c is an integer of 0 to 6; and h, h1, h2 and k are independently an integer from 1 to 6; provided that at least one of R, R¹, R³ and R⁵ is not hydrogen; wherein the partial condensate has a weight average molecular weight of ≤ 10,000.

2. The composition of claim 1 wherein R³ is selected from the group consisting of methylene, ethylene, propylene, butylene, hexylene, norbornylene, cycloheylene, phenylene, phenylene ether, naphthylene and -CH₂-C₆H₄-CH₂-.

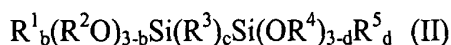
3. The composition of claim 1 wherein the organic polysilica partial condensate further comprises one or more silanes of the formula



wherein M is aluminum, titanium, zirconium, silicon, magnesium, or boron; R¹¹ is (C₁-C₆)alkyl, acyl, or Si(OR¹²)₃; R¹² is (C₁-C₆)alkyl or acyl; and n is the valence of M.

4. The composition of claim 1 wherein the partial condensate has a weight average molecular weight in the range of 2500 to 10,000.

5. A method of preparing an organic polysilica film comprising the step of providing a partial condensate of one or more silanes of formula (I) and one or more silanes of formula (II):



wherein R is hydrogen, (C₁-C₈)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; Y is any hydrolyzable group; a is an integer of 1 to 2; R¹, R², R⁴ and R⁵ are independently selected from hydrogen, (C₁-C₆)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; R³ is (C₁-C₁₀)alkyl, -(CH₂)_h-, -(CH₂)_{h1}-E_k-(CH₂)_{h2}-, -(CH₂)_h-Z, arylene, substituted arylene, or arylene ether; E is oxygen, NR⁶ or Z; Z is aryl or substituted aryl; R⁶ is hydrogen, (C₁-C₆)alkyl, aryl or substituted aryl; b and d are each an integer of 0 to 2; c is an integer of 0 to 6; and h, h1, h2 and k are independently an integer from 1 to 6; provided that at least one of R, R¹, R³ and R⁵ is not hydrogen; wherein the partial condensate has a weight average molecular weight of ≤ 10,000.

6. The method of claim 5 wherein the partial condensate has a weight average molecular weight in the range of 2500 to 10,000.

7. The method of claim 5 wherein partial condensate further comprises one or more silanes of the formula

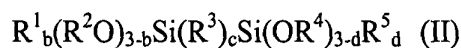


wherein M is aluminum, titanium, zirconium, silicon, magnesium, or boron; R¹¹ is (C₁-C₆)alkyl, acyl, or Si(OR¹²)₃; R¹² is (C₁-C₆)alkyl or acyl; and n is the valence of M.

8. The method of claim 5 wherein R³ is selected from the group consisting of methylene, ethylene, propylene, butylene, hexylene, norbornylene, cycloheylene, phenylene, phenylene ether, naphthylene and -CH₂-C₆H₄-CH₂-.

9. A method of manufacturing a device comprising the steps of:

a) disposing on a substrate an organic polysilica partial condensate of one or more silanes of formula (I) and one or more silanes of formula (II):

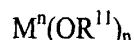


wherein R is hydrogen, (C₁-C₈)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; Y is any hydrolyzable group; a is an integer of 1 to 2; R¹, R², R⁴ and R⁵ are independently selected from hydrogen, (C₁-C₆)alkyl, (C₇-C₁₂)arylalkyl, substituted (C₇-C₁₂)arylalkyl, aryl, and substituted aryl; R³ is (C₁-C₁₀)alkyl, -(CH₂)_h-, -(CH₂)_{h1}-E_k-(CH₂)_{h2}-, -

$(\text{CH}_2)_h\text{-Z}$, arylene, substituted arylene, or arylene ether; E is oxygen, NR^6 or Z; Z is aryl or substituted aryl; R^6 is hydrogen, $(\text{C}_1\text{-C}_6)\text{alkyl}$, aryl or substituted aryl; b and d are each an integer of 0 to 2; c is an integer of 0 to 6; and h, h1, h2 and k are independently an integer from 1 to 6; provided that at least one of R, R^1 , R^3 and R^5 is not hydrogen; wherein the partial condensate has a weight average molecular weight of $\leq 10,000$; and

b) curing the organic polysilica partial condensate to form an organic polysilica film.

10. The method of claim 9 wherein the organic polysilica partial condensate further comprises one or more silanes of the formula



wherein M is aluminum, titanium, zirconium, silicon, magnesium, or boron; R^{11} is $(\text{C}_1\text{-C}_6)\text{alkyl}$, acyl, or $\text{Si}(\text{OR}^{12})_3$; R^{12} is $(\text{C}_1\text{-C}_6)\text{alkyl}$ or acyl; and n is the valence of M.

11. The method of claim 9 wherein the partial condensate has a weight average molecular weight in the range of 2500 to 10,000.

12. The method of claim 9 wherein R^3 is selected from the group consisting of methylene, ethylene, propylene, butylene, hexylene, norbornylene, cycloheylene, phenylene, phenylene ether, naphthylene and $-\text{CH}_2\text{-C}_6\text{H}_4\text{-CH}_2-$.

13. The method of claim 9 wherein the device is selected from the group consisting of electronic devices, optoelectronic devices, optical devices, and display devices.

14. A method of preparing an organic polysilica partial condensate comprising the steps of: a) reacting one or more organosilanes and water in the presence of a condensation catalyst at a temperature and time sufficient to provide an organic polysilica partial condensate having a desired molecular weight, and b) treating the partial condensate with a catalyst removing agent, to remove substantially all of the catalyst.

15. The method of claim 14 wherein less than 1% of the catalyst remains after treatment with the catalyst removing agent.